

margin 10.5. Cotype (in Univ. Colo. Museum), broken specimen, maj. lat. 20.5, min. lat. 17, alt. 14. Cotype (in possession of Mr. Bethel), with third whorl depressed, maj. lat. 20.5, min. lat. 17, alt. in front of aperture 9.5. Cotype (in Acad. Nat. Sci. Phila.), maj. lat. 21.2, min. lat. 18.2, alt. 13.1 mm.

Type locality, Bright Angel Trail, Grand Canyon, Arizona.

NOTES ON THE ANCYLIDAE OF NORTH AFRICA.

BY BRYANT WALKER, SC. D.

(Concluded from p. 117.)

The following so-called species of the *Ancylus fluviatilis* group have been listed from Algeria by Bourguignat and others:

Ancylus brondeli Bgt.

costulatus Kust.

compressiusculus M. T.

subriparius Bgt.

epipedus Bgt.

fluviatilis L.

bledahensis Bgt. = *fluviatilis gibbosus teste* Westerl.

djurdjurensis Deb.

peraudieri Bgt.

platylenus Bgt.

raymondi Bgt.

striatus Q. & G.

simplex Fer. = *fluviatilis teste* Clessin and Westerlund.

gibbosus Bgt. = *fluviatilis* var. *teste* Clessin and Westerlund.

strictus Mor.

In this connection it seems necessary to call attention to the persistently erroneous use of *Ancylastrum* Bgt. for this group by the continental authors, e. g., Fischer, 1881, p. 504, Clessin, 1882, p. 27, Westerlund, 1885, p. 89, Germain, 1913, p. 261.

As Hedley (1894, p. 118) has already shown, Bourguignat twice gave *A. cumingianus* as the type of that group. "Since the describer of the group clearly and repeatedly declared his type to be *cumingianus*, it is not legitimate for Fischer, Clessin or Tryon to alter the type of *Ancylastrum* from *A. cumingianus* to *A. fluviatilis*.

That Bourguignat also included *A. fluviatilis* and other members of *Ancylus* proper in *Ancylastrum* is unfortunate, but it does not invalidate the genus."

If *Ancylastrum*, *Acroloxus*, *Ferrissia*, etc., are retained as subgenera or sections of *Ancylus*, then the group of *fluviatilis* would belong to *Ancylus* s. s. If, however, these other groups are to be considered, as they should be, of generic value, then there is no occasion for any subgeneric or sectional designation of the *fluviatilis* group at all.

In addition to the various representatives of the *fluviatilis* group represented in the fauna of Northern Africa as hereinbefore mentioned from Abyssinia, Tunis, Algeria, Morocco and the Canary and Madeira Islands, the examination of the Pallary collection has revealed the existence of the following species belonging to *Ferrissia* and *Gundlachia*.

FERRISSIA PLATYRHYNCHUS n. sp. Pl. VII, figs. 1-3.

Shell rather elevated, oval, the left margin somewhat more curved than the right, anterior and posterior margins regularly rounded, thin, translucent, light corneous, lines of growth regular and rather strong; anterior slope somewhat radially wrinkled; apex large and very prominent, radially striate, turned to the right and overhanging the posterior slope, surrounded by a distinct constriction, which is deeper posteriorly, obliquely flattened above, with an enormous apical depression, surrounded by a strong ridge, which is more conspicuous along the posterior margin; anterior slope convex; posterior slope very oblique and nearly straight below the apical constriction; sides compressed; lateral slopes flattened, oblique and nearly straight on both sides.

Length 3.75, width 2.25, alt. 1.25 mm.

Type locality, "Baraki, pres le Gué de Constantine, Algeria." Type in the collection of Paul Pallary.

The occurrence of a species of *Ferrissia* in Algeria was a great surprise. A recent visit to Geneva enabled me to examine the collection of Bourguignat and I was able to satisfy myself that there are no *Ferrissias* from Algeria in his collection. In view of the very considerable amount of collecting that has been done in Algeria in years past, the form here described would seem to be very rare as it has not been found by any other collector and only a single specimen

in this instance, which was collected by Letourneaux. It would seem possible that it may be a stray specimen imported in some way from some other locality.

The species is remarkable for the unusual development of the apex, which is very different from any other form species of *Ferrissia* known to me. It is apparently very similar to that of *Ancyclus caliculatus* Bgt. It is possible that in both cases it is an individual abnormality as Clessin has already suggested in regard to Bourguignat's species. Whether this is the fact can only be determined from additional material, which is very desirable. But in any event, it is evidently quite distinct from any of the described species from the Nile Valley.

FERRISSIA ISSELI (Bgt). Pl. VII, figs. 4-8.

1866, *Ancylus isseli* Bourguignat, Moll. Nouv. Lit., p. 214, pl. XXXIII, figs. 13-18.

1882, " " Clessin, Conch. Cab., Ancyliciden, p. 61, pl. 4, fig. 9.

The types of this species were collected by Issel at "Rambe", (Ramleh *fide* Pallary), near Alexandria.

The specimens submitted by M. Pallary were collected by L'hotellerie "on the leaves of the papyrus" at Alexandria.

Through the courtesy of Dr. Weber, I have been enabled to definitely determine this species, which was misapprehended by M. Pallary in his "Catalogue de la Faune Malacologique d' Egypte". The species there figured under this name is really the *A. clessinianus* Jickeli.

Bourguignat's description is sufficiently accurate, but his figures are very inaccurate and misleading. Dr. Weber has kindly supplied me with camera-lucida outlines of the type, which are reproduced (figs. 7-8), and in reference to them, he writes: "Vous pouvez ainsi comparer ces dessins avec ceux publiés par Bourguignat et voir les différences, car, à notre avis, elles sont notables; pour nous, les dessins de Bourguignat ne sont pas corrects; maintenant, il faut ajouter qu'il existe une assez grande variation de forme d'un individu à l'autre chez la même espèce".

Apparently this species is not so abundant as the others collected by L'hotellerie as only two examples were found in the material received from M. Pallary. These agree very exactly with the original description and the figures sent by Dr. Weber and are, undoubtedly, Bourguignat's species.

The shell is small, obovate, with a very prominent, almost bulbous, apex, which is radially striate and decidedly more excentric than in *F. pallaryi*, the anterior slope is very convex and the posterior slope is nearly straight below the depression beneath the projecting apex; the lateral slopes are steeper and less oblique than in *pallaryi*. Compared with the none-septate form of *Gundlachia l'hotelleriei* it is larger, more decidedly obovate, higher, with a more convex anterior slope and the apex is much more prominent. *A. clessinianus* is entirely different in its shape and proportions. The specimen I have figured measures: length 3, width 2, alt. 1 mm.

A small set from Ismailia, which I think belong to this species, are all very much laterally compressed and are proportionally higher than the typical form. A characteristic example measures 3.25 x 1.75 x 1.5 mm. This peculiarity is probably the result of some unusual environmental conditions. A similar instance in *Ferrissia parallela* Hald. was figured by me several years ago, (1904, p. 77, pl. V, figs. 4-6).

FERRISSIA CLESSINIANA (Jickeli). Pl. figs. 9-11.

1882. *Ancylus clessinianus* Jickeli, Jahrb. Deutsch. Mal. Ges., p. 366.

1909. *Ancylus isseli* Pallary, Mem. Inst. Egypt., VI, p. 60, pl. IV, fig. 11.

According to Pallary the types of this species were sent by the collector, L'hotellerie, to Clessin under the MSS. name of *A. l'hotelleriei* Bgt. But it is quite different from the shells that Bourguignat had in his collection under that name. Jickeli did not figure his species, but his description agrees exactly with specimens that I have referred to it and there seems to be no reasonable doubt as to the identification. The example figured is the shell figured by Pallary as *A. isseli* and is in his collection. It measures: length 4.25, width 2.33, alt. 1.25 mm.

The species is larger than any of the associated species of the Nile fauna and entirely different in shape, which in a general way recalls that of the American *A. parallelus* Hald.

FERRISSIA PALLARYI n. sp. Pl. VII, figs. 12-14.

Shell small, subdepressed, rather broadly ovate, the left margin more curved than the right; anterior and posterior margins regularly

rounded; thin, translucent, light horn color; lines of growth very fine and regular; apex radially striate, obtuse, not prominent, not elevated above the anterior slope, situated at about the posterior third of the length and distinctly turned to the right; anterior slope slightly, but rather evenly curved from the apex, but becoming nearly straight towards the anterior margin; posterior slope nearly straight, being but slightly incurved; lateral slopes oblique, the left quite convex, the right nearly straight, slightly incurved beneath the apex.

Length 3.25, width 2.25, alt. 1 mm.

Type locality, Canal Mahmoudich, Alexandria, Egypt.

Type in the collection of Paul Pallary. Cotype, Coll. Walker.

Although only one mature and two immature examples are before me, this species is so entirely different from the other species of the Nile that I do not hesitate to describe it. Its broad-oval outline, more oblique lateral slopes and the position and shape of the apex are characteristic and quite unlike any of the described species from that region.

Named in honor of M. Paul Pallary, who has done much to elucidate the fauna of Northern Africa.

GUNDLACHIA L'HOTELLERIEI ("Bourguignat") n. sp. Pl. VII, figs. 15-21.

Ancylus clessini Pallary, Mem. Inst. Egypt., VI, p. 59.

Shell very small. The non-septate form (figs. 15-19) is subdepressed, narrowly ovate, being wider anteriorly, mostly on the left margin, the right being nearly straight in the median portion and about equally curved at both ends; anterior and posterior margins regularly rounded; thin, translucent, light horn color; lines of growth fine and regular, anterior slope somewhat radially wrinkled; apex prominent, very obtuse, radially striate and turned towards the right, situated at the posterior $\frac{1}{4}$ of the length; anterior slope long, decidedly and regularly convex; the posterior slope short and straight, but slightly oblique, from the base of the protuberant apex; left slope very convex above, thence descending in a nearly straight, oblique line to the margin; right slope less oblique and nearly straight, being very slightly concave below the swell of the apex.

Length 2.75, width 1.5, alt. 1 mm.

The septate form (figs. 20-21) is smaller than the non-septate and

the lateral margins are less expanded, they are nearly parallel, the left being slightly convex, the right slightly concave; as usual in this stage the sides of the aperture have the appearance of being drawn in toward each other in the process of constructing the septum, in front of the septum the anterior margin is somewhat expanded; the septum occupies about two-thirds of the entire length, it is decidedly curved along the lateral margins and posteriorly, but the anterior portion is flattened in the center as though from contact with the back of the animal when in motion and towards the septum descends quite obliquely; the margin of the septum is only slightly convex in the center, curving quite abruptly forward as it joins the lateral margins of the shell. The surface conditions are as in the non-septate form.

The fully matured (Gunlachoid) stage is unknown.

Length 2.1, width at margin of septum 1, greatest width 1.2, alt. 75 mm.

Type locality, Alexandria, Egypt.

Types no. 35966 Coll. Walker. Cotypes in the collection of Paul Pallary.

Dr. Weber has kindly furnished outlines (figs. 15-16) of the types of Bourguignat's unpublished species and there can be no question but that this, and not the *A. clessinianus* of Jickeli, was the form that he had intended to describe under the name which I have adopted.

It is also the species that Pallary erroneously referred to as *A. clessini*, but did not describe. Both names being without published description, I have given the preference to the anterior one of Bourguignat.

I have no doubt but that both of the forms above described belong to the same species.

The non-septate form is very similar to the North American *A. shimckii* Pils. and *A. pumilus* Sterki, but differs from both in elevation and other details. Dr. Pilsbry has already suggested that *shimckii* is the non-septate form of a *Gundlachia*, and I am inclined to think that *pumilus* will prove to be the corresponding condition of the Ohio *Gundlachia*, which is probably the *meekiana* of Stimpson.

The occurrence of this species in Egypt was wholly unexpected and was the first record of the genus from the Old World.¹

¹Shortly after these shells were received from M. Pallary, I received from

Unfortunately the fully matured form with the secondary growth has not yet been found.

The fact certainly seems to be that the range of *Gundlachia*, like that of *Ferrissia* is world-wide and the two are apparently coincident. It is quite possible that others of the so-called *Ferrissias* will eventually prove to be the non-septate forms of *Gundlachia*. At the same time, if the evidence afforded by the North American species is to be relied upon, it is only certain species of "*Ferrissia*" that ever become septate. There is no evidence, so far as I know, that the typical species of *Ferrissia* ever form a septum.

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Mr. John Farquhar of Grahamstown, Cape Colony, two specimens of a fully matured *Gundlachia* from that region. To which, if any, of the recently described species of *Ferrissia* from South Africa this form is to be approximated I am as yet uncertain. But the occurrence of the genus from both of the extreme ends of Africa is certainly a matter of great interest.

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UNION OF THE WABASH AND MAUMEE DRAINAGE SYSTEMS.

BY CALVIN GOODRICH.

If only as a matter of record, it may be worth while to set down the fact that the drainage of the Great Lakes and that of the Ohio became united in the great flood of March-April, 1913.

A little southwest of Fort Wayne, Ind., the St. Mary's River, tributary to the Maumee, approaches within three miles of the Little Wabash River, belonging to the Ohio system. The land between is known as "The Prairie" and the dividing line of the two drainage basins upon it is not perceptible to the human eye. It was across this stretch that the St. Mary's River sent its flood waters last spring, and no doubt it was responsible in no small measure for the damage wrought at Peru and Logansport some distance down the Wabash.

The Wabash and Erie canal, now many years abandoned, skirted